

Math 541 Fall 2017 Schedule

Lecture Date	Topic
Sep 04	Labor Day
Sep 06	I.1 Topological Spaces; I.4 Bases, axioms of countability, and product topologies Part I
Sep 08	I.4 Bases, axioms of countability, and product topologies Part II; I.9 vector spaces; I.10 Topological vector spaces; I.13 Metric Spaces Part I
Sep 11	I.13 Metric Spaces Part II; I.16 On the structure of a Complete Metric Space
Sep 13	II.1 Partitioning open sets of \mathbb{R}^N ; II.2 Limits of sets, characteristic functions and sigma algebras
Sep 15	II.3 Measures Part I
Sep 18	II.3 Measures Part II; II.4 Outer measures and sequential coverings Part I
Sep 20	II.4 Outer measures and sequential coverings Part II; II.5 The Hausdorff outer measure in \mathbb{R}^N Part I
Sep 22	II.5 The Hausdorff outer measure in \mathbb{R}^N Part II
Sep 25	II.6 Constructing measures from outer measures
Sep 27	II.7 The Lebesgue-Stieltjes measure on \mathbb{R} ; II.8 The Hausdorff measure on \mathbb{R}^N
Sep 29	II.9 Extending measures from semialgebras to sigma algebras
Oct 02	II.10 Necessary and Sufficient Conditions for Measurability Part I
Oct 04	II.10 Necessary and Sufficient Conditions for Measurability Part II
Oct 06	II.11 More on Extensions from Semialgebras to sigma algebras; II.12 The Lebesgue Measure of sets in \mathbb{R}^N Part I
Oct 09	II.12 The Lebesgue Measure of sets in \mathbb{R}^N Part II
Oct 11	II.12 The Lebesgue Measure of sets in \mathbb{R}^N Part III
Oct 13	II.13 A Nonmeasurable Set Part I
Oct 16	II.13 A Nonmeasurable Set Part II
Oct 18	II.14 Borel Sets, Measurable Sets, and Incomplete Measures Part I
Oct 20	II.14 Borel Sets, Measurable Sets, and Incomplete Measures Part II
Oct 23	II.14 Borel Sets, Measurable Sets, and Incomplete Measures Part III
Oct 25	II.15 More on Borel Measures Part I
Oct 27	II.15 More on Borel Measures Part II
Oct 30	III.1 Measurable Functions Part I
Nov 01	III.1 Measurable Functions Part II
Nov 03	III.2 The Egorov Theorem
Nov 06	III.3 Approximating Measurable Functions by Simple Functions; III.5 Quasi-continuous functions and Lusin's Theorem Part I
Nov 08	III.5 Quasi-continuous functions and Lusin's Theorem Part II
Nov 10	III.6 Integral of Simple Functions; III.7 The Lebesgue Integral of Nonnegative Functions
Nov 13	III.8 Fatou's Lemma and the Monotone Convergence Theorem; III.9 Basic Properties of the Lebesgue Integral Part I
Nov 15	III.9 Basic Properties of the Lebesgue Integral Part II
Nov 17	III.10 Convergence Theorems
Nov 20	III.11 Absolute Convergence of the Integral; III.12-14 Product of Measures and the Fubini-Tonelli Theorem
Nov 21	III.16 Signed Measures; III.17 The Radon-Nikodym Theorem Part I
Nov 22-24	Thanksgiving Holiday
Nov 27	III.17 The Radon-Nikodym Theorem Part II
Nov 29	V.1 Functions in $L_p(E)$ and their Norms; V.3 The Holder and Minkowski Inequalities Part I
Dec 01	V.3 The Holder and Minkowski Inequalities Part II
Dec 04	V.3 The Holder and Minkowski Inequalities Part III
Dec 06	V.5: $L_p(E)$ as normed space of equivalence classes; V.7 Convergence in $L_p(E)$ and completeness Part I
Dec 08	V.7 Convergence in $L_p(E)$ and completeness Part II
Dec 11	V.18 If $E \subset \mathbb{R}^N$ and $p \in [1, \infty)$, then $L_p(E)$ is separable Part I
Dec 13	V.18 If $E \subset \mathbb{R}^N$ and $p \in [1, \infty)$, then $L_p(E)$ is separable Part II
Dec 15	Reading Day
Dec 21	Final Exam (in Class) 11 a.m. - 2 p.m.